

On The Fringe

Journal of the Native Plant Society of Northeastern Ohio

Program Schedule – Summer 2015

Saturday, June 20, 9 am – Noon – Sedge Identification Workshop, The West Woods Nature Center, Geauga County. Rick Gardner, ODNR Division of Natural Areas & Preserves Botanist, will give an overview of the confusing sedges and hints for identification, particularly the *Carex* genus. An indoor session will be followed by an excursion into the field. **Directions:** Take Rt. 87 east from Rt. 306 in Russell Township approx. 2 miles to the park entrance on south side of the road. 9465 Kinsman Road, Novelty, Ohio 44072. Registration required and limited to 15 participants. Call Judy at 440-564-9151(H); 440-279-0890 (W).

Sunday, July 26, 3 pm – Northern Monkshood, Summit Metroparks, Members Only. Rob Curtis, Park Biologist with Summit Metro Parks, will take **members only** on a special adventure to see the state endangered northern monkshood on their property. Please be advised this is a rugged hike involving thick mud and scaling a 10-ft rock. To thank him for taking us into this special area we plan to remove some invading plants. Registration is limited to 5 people and is required. Call Judy at 440-564-9151; 440-279-0890 (W). *Sorry this program is full; we are no longer taking reservations.*

Wednesday, August 26, 6 pm – Prairie Prowl, Frohring Meadows Prairie. After several years getting established, the Frohring Meadows Prairie is ablaze with color. Discover the diversity of prairie species with botanist Judy Barnhart. Joint program with Geauga Park District. **Directions:** Take US-422 to Rt 306. Turn north onto Chillicothe/SR306. Turn left onto Chagrin Road/CR-9. Turn right onto Savage Road and continue 0.8 miles. Park is on the left. 16780 Savage Road, Bainbridge Township 44023. No registration required.



Hemlocks to Hellbenders: Flora-Quest 2015 Registration is Now Open

Whether you are a professional naturalist or new to the wonders of the great outdoors, Flora-Quest has a trip designed for you. Since 2007, we have been educating Ohioans about their unique botanical communities. Our expert guides will lead you to Mohican's most scenic locations and connect you with Ohio's natural heritage.

Stroll to scenic waterfalls, discover nature high and low, or dive into a new habitat with our aquatic experts. This year we are embracing the hemlock forests and uplands of Mohican State Park and Forest. Jason Larson has the route with giant Hemlocks. Jim Berry is on-board for the birds, and Greg Lipps can't wait to show you a Hellbender. Whether you choose Hellbenders or Hemlocks, every trip is an adventure. Our trips cover all levels of ability and expertise.

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The Mission of the Native Plant Society of Northeastern Ohio is to promote the study, appreciation and conservation of the native plants and plant communities of Ohio.



*Hemlock Falls
Mohican Outdoor School*

The conference outings on **Aug 27-29, 2015** will explore the hills, ferns, rock formations and hemlock trees of the Clear Fork River Gorge. Flora-Quest also has several of Ohio's best speakers scheduled for programs on Mohican's ecosystems and habitats. We will visit Malabar Farm, home of author Louis Bromfield, to learn about the 1940's visionary and the beautiful old growth forest trees and wetlands he protected. Bromfield helped us to understand good farming practices are vital to healthy aquatic systems, which impact the hellbender and the people in Pleasant Valley and beyond. We will honor the Bromfield legacy, which feeds the land and protects our natural heritage.

Our conference fills quickly each year, as we keep it a small and hands-on educational event. Book your room at the beautiful Mohican Lodge, the center of our activities. Please join us in Mohican Forest and Pleasant Valley; there is much to learn and love about this land. Whether the quest you choose visits waterfalls, the counter-facing trails of the river gorge, or an aquatic adventure, welcome to Mohican. We are ready for you.

Details and pricing at: www.flora-quest.com.

Request for Proposals for 2015 Annual Grant

The Native Plant Society of Northeastern Ohio is accepting applications for our 2015 Grant(s). We will consider projects that demonstrate excellence in research, conservation, or education that clearly support the mission of the Native Plant Society of Northeastern Ohio. The amount of each grant will be up to \$500. The number of grants available will be dependent on funding. Submissions must be received by 5:00 PM Friday, September 18, 2015. The grant(s) will be awarded at the Annual Meeting of the Society November 14, 2015. For more information on the grant and how to apply, please see our website www.NativePlantSocietyNEO.org or contact Kathy Hanratty at nativeplantsocietyneo@gmail.com.

Facing the Peril to Native Landscapes Appreciating Both the Activist and Botanist within Us

By Latham Davis

As wildflower enthusiasts we get our joy from discovering and observing the details of plant structures and habitats.

Yet no matter how much we focus on the joy, we are being nagged by three broad problems that affect the survival of all native plants and their communities. First is habitat destruction; second, the invasion of exotic species; and, third, global warming.

All three are distinct concerns, but they are also interrelated. For instance, an indigenous plant community can be wiped out by an apartment development but can also be smothered by bush honeysuckle or multiflora rose. Changing seasons can degrade plant communities and encourage exotics.

Of our three overriding problems, perhaps none is more ominous than global warming. We can set aside patches of land and parks to protect native habitat that we patrol for those exotic invaders, but what about the impact of a changing climate—when zone five for gardeners becomes zone six or seven?

There are levels of complexity in each of these problems, especially climate change, and we have difficulty determining the seriousness of the problem. Rather than reading the science, most people seem to listen only to radio and television “pundits.” Others may ask, “Won’t native flora just adapt?” The debate, though hardly a real debate, is frustrating if not infuriating. As we listen, we become aware of how many people are poorly educated and ill-informed about the natural world.

All of us have been observing milder winters and early springs—two to four weeks earlier in blooming patterns this year. How closely is this corresponding to scientific models and predictions? We look at what is happening in our gardens and along the trails, and we wonder.

I’ve been fortunate to hear two public lectures by a scientist for the National Center for Atmospheric Research in Boulder, Colorado. His name is Michael T. Coffey. Not once in his lectures did he mention “global warming,”—not wanting, I’m sure, to become a target—but his presentations were filled with data about the buildup of carbon dioxide and other chemicals in the atmosphere, which corresponds to the rise, at an accelerated rate, of global temperatures.

To add emphasis to this point, July 2012 marked the hottest month on record for the contiguous U.S., according to the National Oceanic and Atmospheric Administration.

Yet, the issue of climate change is not just changing temperatures. As scientists have warned us—even twenty or thirty years ago—some areas of the world will become drier, some areas wetter. Extremes will become more normal. How well can native flora be expected to adapt to these sudden, radical changes?

A report* by researchers at the University of California at Santa Barbara’s National Center for Ecological Analysis explained in an article published in the journal *Science* that while some plants are blooming sooner due to early spring temperatures, other plants are delaying the process.

“The plants in question (490 species on two continents) require vernalization, a chilling requirement—that is, many of these plants require a temperature drop in fall and winter as a cue to become dormant until spring flowering season arrives.”

We may then wonder what becomes of the pollinators; what happens to their life cycles, and what is the future impact on the plants they pollinate?

We are also aware of how milder winters allow insect pests to spread more quickly with sometimes devastating effects on flora of all types.

An article published in the on-line journal *Science Daily* cites research done by scientists at Northern Arizona University who studied native species at various elevations for over ten years. (They cautioned against short term studies.) They found that “long-term warming resulted in loss of native species and encroachment of species typical of warmer environments.”

These findings may not surprise you. But the next question is, “What can we do to slow, halt, or reverse these trends?” I am the kind of optimist who believes that if a nation, a civilization, or a generation is motivated to solve a problem, they can solve that problem; they can put Humpty Dumpty together again. Unfortunately, as science suffers the slings and arrows of skeptics, we continue to struggle with the age-old moral problems of greed, pride, and arrogance. In the meantime, our mistakes, moral or mechanical, have global implication.

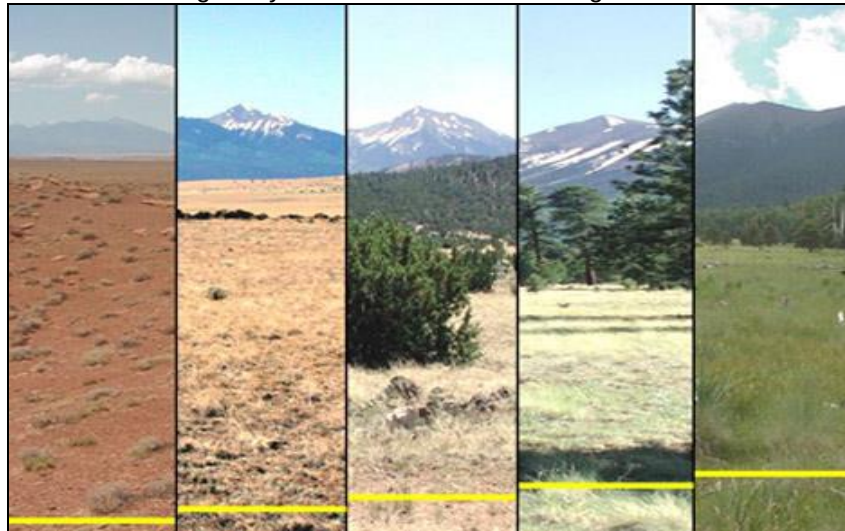
I am inspired by those of us who take personal action to reduce their “carbon footprint” and by those who take the spade to invasive exotics. In my own garden, I practice what Sara Stein advocated in her book, *Noah’s Garden: Restoring the Ecology of Our Own Back Yards*.

However, when I feel particularly helpless, observing my rhododendrons decline in the dry heat and my bog ferns wilt, I assume another identity. The true naturalist, I was once told, is the person whose joy is found in observing nature—not trying to save the baby bird from the rat snake or trying to save the rat

snake from the hawk, but by finding in nature a wisdom greater than ourselves and moving closer to that wisdom.

You may find interesting a piece in the August 3 online issue of the Washington Post by James E. Hansen, director of the NASA Goddard Institute for Space Studies and one of the leading advocates for action on global warming. See http://www.washingtonpost.com/opinions/climate-change-is-here--and-worse-than-we-thought/2012/08/03/6ae604c2-dd90-11e1-8e43-4a3c4375504a_story.html

Decade-long study shows short-term and long-term differences



Researchers subjected grassland ecosystems to simulated climate change.

*[Cook, Benjamin, et al. Divergent responses to spring and winter warming drive community level flowering trends, *Proceedings of the National Academy of Sciences*, Vol. 109 no. 23, 2012 ~ OTF Editors.]

Reprinted from the Newsletter of the Tennessee Native Plant Society, September 2012, Vol 36, No 3.
Picture taken from the website of Northern Arizona University, www.nau.edu

“T-Bee”

By Edyta Zielinska

A New Zealand microbiologist analyzed the volatile constituents emitted by the tuberculosis bacterium and then tested the breath of TB patients for similar chemicals. He found four matches. A colleague with co-workers then noted that these were known insect attractants. Serendipity led to the proposal that honey-bees may be trained to exhibit specific behavior upon detecting these chemicals. This behavior then could be developed into a new, cheap, easy diagnostic test for TB in countries of need.

Initial work by Sagar and Suckling has demonstrated that this indeed can be done. “T-Bee” can be trained to detect two of the four target compounds at very low concentrations. Their researches are continuing, but chalk another one up for bees assisting humans; now in health diagnostics!

To read the entire abstract go to: <http://www.the-scientist.com/?articles.view/articleNo/31783/title/T-Bee>.

Reprinted from the Wildflower Association of Michigan Newsletter, *Wildflowers*, Spring 2012, Vol 17, No 1.

Invasive:**Porcelain-berry, *Ampelopsis brevipedunculata***
Grape family**NATIVE RANGE**

Northeast Asia - China, Korea, Japan, and Russian Far East

DESCRIPTION

Porcelain-berry is a deciduous, woody, perennial vine. It twines with the help of non-adhesive tendrils that occur opposite the leaves and closely resembles native grapes in the genus *Vitis*. The stem pith of porcelain-berry is white (grape is brown) and continuous across the nodes (grape is not), the bark has lenticels (grape does not), and the bark does not peel (grape bark peels or shreds). The leaves are alternate, broadly ovate with a heart-shaped base, palmately 3-5 lobed or more deeply dissected, and have coarsely toothed margins. The inconspicuous, greenish-white flowers with "free" petals occur in cymes opposite the leaves from June through August (in contrast to grape species that have flowers with petals that touch at tips and occur in panicles). The fruits appear in September-October and are colorful, changing from pale lilac, to green, to a bright blue. Porcelain-berry is often confused with species of grape, *Vitis*, and may be confused with several native species of *Ampelopsis*: *Ampelopsis arborea* and *Ampelopsis cordata*.



Porcelain-berry,
Ampelopsis brevipedunculata

ECOLOGICAL THREAT

Porcelain-berry is a vigorous invader of open and wooded habitats. It grows and spreads quickly in areas with high to moderate light. As it spreads, it climbs over shrubs and other vegetation, shading out native plants and consuming habitat.

DISTRIBUTION IN THE UNITED STATES

Porcelain-berry is found from New England to Georgia and west to Iowa and is reported to be invasive in the Northeast in the District of Columbia and seventeen states: Connecticut, Delaware, Georgia, Illinois, Iowa, Kentucky, Massachusetts, Maryland, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, Virginia, and Wisconsin.

HABITAT IN THE UNITED STATES

Porcelain-berry grows well in most soils, especially forest edges, pond margins, stream banks, thickets, and waste places, where there is full sunlight to partial shade, and where it is not permanently wet. Porcelain-berry appears to be less tolerant of heavily shaded areas, such as those found in mature forest interiors.

BACKGROUND

Porcelain-berry was originally cultivated around the 1870s as a bedding and landscape plant. In spite of its aggressiveness in some areas, it is still used in the horticultural trade (for example, the ornamental *A. brevipedunculata* 'Elegans' is often recommended as a landscape plant with a cautionary note that "care must be taken to keep it from overtaking and shading out small plants"). The same characteristics that make porcelain-berry a desirable plant for the garden—its colorful berries, good ground coverage, trellis-climbing vines, pest-resistance, and tolerance of adverse conditions—are responsible for its presence in the United States as an undesirable invader.

BIOLOGY & SPREAD

Porcelain-berry spreads by seed and through vegetative means. The colorful fruits, each with two to four seeds, attract birds and other small animals that eat the berries and disperse the seeds in their droppings. The seeds of porcelain-berry germinate readily to start new infestations. Porcelain-berry is often found growing in riparian areas downstream from established patches, suggesting they may be dispersed by water also. The taproot of porcelain-berry is large and vigorous. Resprouting will occur in response to cutting of above-ground portions.

MANAGEMENT OPTIONS

Because porcelain-berry vines can grow up to 15 ft. in a single growing season, especially when rainfall is abundant, and seed may be viable in the soil for several years, effective control requires dedicated follow-up. Treatment measures often must be repeated during the growing season and for several years afterwards to fully eradicate the plant. Prevention of flowering, fruiting and production of mature seeds will help reduce its spread. For more information on management options go to www.nps.gov/plants/alien/fact/ambr1.htm.

Content for this article taken from www.nps.gov/plants/alien/fact/ambr1.htm.

Our Native Bamboo, *Arundinaria gigantea*

By Brad Salmon

Allow me to begin this article with a confession—I am an avid bamboo grower and proponent. This generally puts me at odds with native plant enthusiasts, due to the capacity of the “running” species of bamboo to colonize an area and spread beyond desired boundaries. Although more properly classified as a spreading plant than an invasive, bamboo can indeed become problematic when planted irresponsibly. I think that the appropriate use of this valuable plant, with more than 1,200 species, has the potential to curb the destruction of native bamboo forests, but that’s a topic for another forum.



Arundinaria gigantea

Picture taken from www.bamboogarden.com

When bamboo first captured my attention, I consumed every article, book, website, and conversation I could find on the plant, and was surprised to learn that a species of bamboo is native to southern Indiana—*Arundinaria gigantea*.

The US has three recognized native species of bamboo, all forms of *Arundinaria gigantea*, including two sub-species: *Arundinaria gigantea* ssp. *Tecta* and the newly recognized deciduous form, *Arundinaria gigantea*, *Appalachiana*. Originally it ranged from Maryland, Virginia, and Florida to Texas, northward to Missouri and the Ohio River Valley, in its northernmost range of south central Indiana forming vast “canabrakes” or groves.

This bamboo has a rich and important history in the US, but in my experience few people are aware of this threatened native Indiana plant. I suspect that few readers of this journal have ever encountered *Arundinaria gigantea* in the wild despite its once having been widely distributed in the state.

Arundinaria gigantea forms colonies on silt-rich stream banks, the canes generally ranging from 1 to 5 meters in height by 1 to 3 centimeters in diameter. The groves produce new canes in early to mid-summer. These first-year canes have “persistent culm sheaths” and only one or two simple branches during the first year. In subsequent years, additional branches and foliage leaves tiller up the initial branches, increasing significantly in years two and three.

Bamboo is a unique plant in that it rarely flowers and sets seed, with decades between flowerings, but the entire grove flowers at once, setting vast amounts of seed. There are local tales of how fat the squirrels were during periods of the canebrake flowerings. Over the years, *Arundinaria gigantea* has flowered and produced multiple clones, somewhat adapting to local conditions and resulting in varying form and appearance.

Native Americans utilized the bamboo for basketry and also hunted the canebrakes, as they knew that wildlife sought refuge there.

During the civil war, the Underground Railroad used the vast network of groves for concealed passage during the northern migration. In some groves, the density was estimated to be 65,000 culms per acre. As settlers moved about, they learned to associate the canebrakes with fertile soil, and huge areas were cleared for farming, breaking up the vast groves into small islands.



Arundinaria gigantea
Picture taken from plants.ifas.ufl.edu

Brad Salmon is a Bamboo aficionado and is pleased to introduce you to this rare Indiana native plant. For more information, contact Brad at info@needmorebamboo.com.

Reprinted from *INPAWS*, The Indiana Native Plant Society newsletter, Summer 2011, Vol 18, No 2.



Book Review:

The Wild Here and Now

By Susan Charkes

Publisher: Arboreality Press. This is a self-published, print on demand book.

Pages: 170 pages

ISBN-10: 0615902146

ISBN-13: 978-0615902142

Paperback

Price: \$12.18; price varies

Illustrated by Mary Priestley

Susan Charkes, who lived in Sewanee, Tennessee, in 2006, writes about nature where you least expect to find it: right in front of you. Nature in *The Wild Here and Now* is not something you go somewhere else to discover. It's all around you: a squirrel in a tree cavity, a mayfly on the hood of a car, a turkey vulture overhead, a gnat under the collar.

Both a poet and a writer of nonfiction (including several books on the outdoors), Charkes has a supple style that conveys the same quality of surprise that she finds in nature. *The Wild Here and Now* inspires the reader to see, hear and feel nature with newly sharpened senses: to discover a new world, right outside the front door. Mary Priestley's pen and ink drawings throughout capture this spirit. Charkes comments, "When I moved to Sewanee it was Mary Priestley's writings about the outdoors that first drew me to the community's unique natural wonders, and also initiated a personal relationship that is based on a shared love for the small things in nature that Mary's drawings convey perfectly."

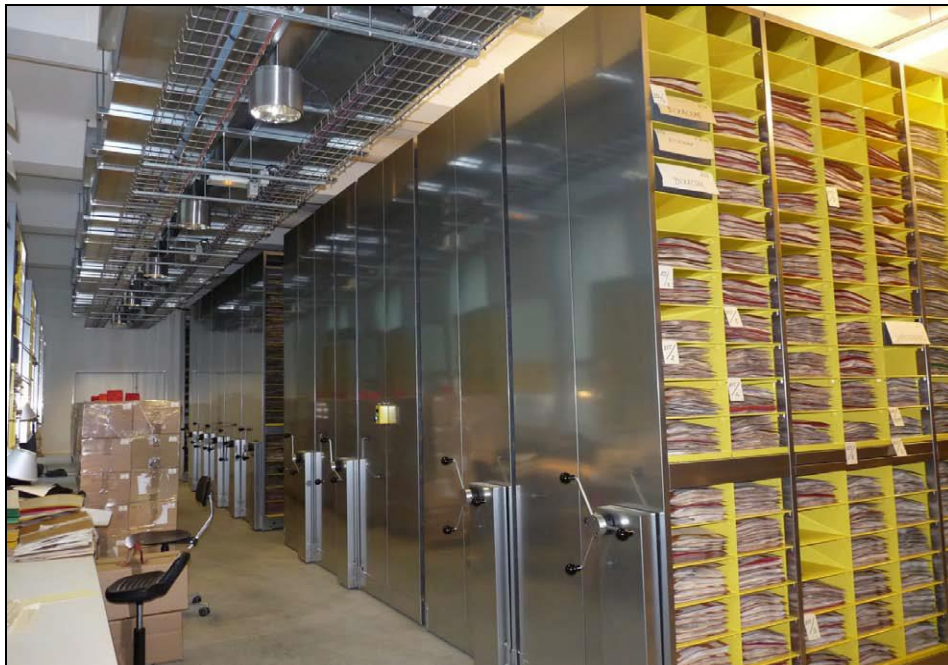
Reprinted from the Newsletter of the Tennessee Native Plant Society. December 2013 Vol 37, No 4.

A Curator's Perspective:**The Erosion of Collections-Based Science:
Alarming Trend or Coincidence?****By Vicki A. Funk**

Over the last few years many visitors have passed through the doors of the U.S. National Herbarium (Herbarium Code: US) bringing depressing news about some of our fellow botanical institutions and research centers. Institutions, which house historic and otherwise important botanical specimens, have been closed. The scientists who study, preserve, and curate them, have been fired, downsized, forced into retirement, or had their focus directed away from taxonomy and systematics. When reasons are given, they usually involve budget shortfalls; unfortunately, collections and research are easy targets. But when I mentioned this to one former museum director who was visiting, his reply was, “When I was a director and had a budget shortfall I went out and raised more money, I did not fire my staff!”

Is this a trend or a coincidence? Perhaps a more detailed examination of events will provide an answer, and so we begin with the Milwaukee Public Museum and continue up to the ongoing recent troubles at the Royal Botanic Gardens, Kew.

In 2005 *Milwaukee Public Museum* (MIL; established in 1882; 250,000 specimens) eliminated science and fired most of its staff. If you check the museum's website, it seems they no longer have much of a science presence, just a few collections managers, emeritus curators and adjunct curators who have jobs elsewhere. At the time, most of us thought this was a unique event. How could an institution with 4.5 million objects and specimens, spread over a broad array of departments go out of the research business? How did they think they would keep their collections, exhibits and education programs up to date? But in the nearly 10 years since that event, additional examples of this type of nearsighted administrative behavior have become more frequent as research program after research program has taken the brunt of budget shortfalls; we have become increasingly more alarmed.



A good model to follow: Muséum National d'Histoire Naturelle in Paris, which has recently renovated its herbarium, has imaged about 8 million specimens. All of their herbarium specimens are now stored in new compactors, organized by the phylogenetic system.

Fairchild Tropical Botanic Garden (FTG; established in 1936; 165,000 specimens)

Fairchild has long been active in systematic research. The board and administration decided to move to a different model where they would no longer pay the salaries of research staff but rather have Florida International University faculty work out of Fairchild. They currently have only one research scientist working there. Over a period from 2007 to 2009, the emphasis for research seems to have shifted from tropical systematics to ecology and conservation. In fact, you cannot even find the herbarium on the Fairchild website. If you search for it on Google, all you can find is the FTG Virtual Herbarium, which contains only about half the collections.

New York State Museum, Albany (NYS; established in 1836; 279,000 specimens)

Most of the research staff was let go a few years ago, including all of the botanists. According to the staff directory, there are four curators, all zoologists, one of whom appears to be a state employee. They do have collection managers listed for most collections, including botany, but the herbarium does not appear to have an active research program.

Brooklyn Botanic Garden (BKL; established in 1910; 300,000 specimens)

In August 2013, Brooklyn Botanic Garden suspended its research program and shuttered its herbarium. All members of the Garden's Science Department were laid off, except for one herbarium assistant who was transferred elsewhere and a part-time plant mounter. The Science Department's director was on sabbatical at NSF,

and she has since left the Garden for a position elsewhere. The Director of Living Collections was made the Director of Collections with the additional responsibility of managing the herbarium. The staff laid off had 60 years of combined experience with BKL. Currently no scientific research is being conducted at Brooklyn Botanic Garden. The herbarium, once widely used by scientists, especially those doing research in New York City and Long Island, remains essentially inaccessible to the public.

Instituto Nacional de Biodiversidad (INBio; established in 1989; 183,000 specimens)

In 2011 INBio announced that it was going out of the collections and research business. The herbarium was rapidly moved into another building because the building built specifically for the herbarium had been sold. Recently, the entire staff was let go. This important collection is completely databased and available on line, and together with the herbarium at the Museo Nacional de Costa Rica (CR; 215,000 specimens), they make Costa Rica the best botanically documented country between Mexico City and Bogota. Fortunately, the Museo has agreed to take charge of the herbarium, although, currently, they do not have the space to incorporate the specimens. So far, there is no guarantee that there will be jobs for the staff. Hopefully, there will be a new building constructed so that both collections can be combined and additional trained staff will be hired to manage it.

Field Museum of Natural History (F; established in 1893; 2,700,000 specimens)

Staffing for research and collections at the Field Museum had

been on the decline for years. Beginning in 2009, between buyouts and staff leaving for other jobs, science staffing took a steep turn downward. Currently, there are only two curators in Botany and three support staff to study and manage this enormous resource. Fortunately there are three emeriti that continue to work. There are no science departments, just one "Action Science Center." The collections are well maintained because of the dedication of collections staff, but there is no real growth. However, the emphasis seems to be on marketable skills, and plant taxonomy does not seem to be on the list. There is no announced plan to hire additional staff.

California Academy of Sciences (CAS; established in 1853; 2,000,000 specimens)

Recently the administration of CAS has decided to shift the focus of the museum. Established scientists were pressured into retiring. New people will be hired but they will have a significant focus on outreach using social media. Oddly this comes after the construction of a new building to house the collections.

Royal Botanic Gardens, Kew (K; established in 1759; became a government institution in 1841; 7,000,000 specimens with well over 350,000 types)

For months rumors have been in circulation about the drastic changes that are taking place at Kew. Finally enough people have visited and others have passed through US, that we are getting a better picture of what is happening. Kew, long a premier botanical institution for research and collections, is under serious attack. Reports indicate that the Herbarium, Jodrell Laboratory, and Millennium Seed Bank are to

undergo drastic administrative changes and a significant reduction in science staff. The major structural change is that these three administrative units will be replaced by six focal areas: Collections, Identification and Naming, Comparative Plant and Fungal Biology, Conservation, Natural Capital, and Biodiversity Informatics. Nine people have been appointed to guarantee new positions. Everyone else is being forced to apply for open new positions that are made available.

When this crisis at Kew started, 25 people decided to retire, and those positions were lost altogether. That left 200 staff members in the three units. The scientific staff is scheduled to be reduced from 200 to 176 which makes it seem as if only 24 positions will be lost. However this number is misleading—the 176 positions include 12 new positions in Biodiversity Informatics, at least some of which may need to be hired from outside Kew, which would further reduce the number of current Kew staff to be retained. Also, the new positions include 27 ‘Career Development Fellows,’ which are fixed nonrenewable term (3-5 years)

appointments designed to develop researchers from current Kew staff. These staff members are then apparently expected to seek research positions at Kew, attract independent funding, or simply become redundant and have to leave Kew.

Except for the heads of the new focal areas and a limited number of new slots that are very close to existing ones, everyone else will have to apply for one or more of the positions that have been created in the new structure. Any new positions that are not filled by current Kew staff will be opened to a wider pool of applicants. It appears then that at a minimum, 24 current Kew staff members in science will lose their jobs by December 1, but reason suggests that the number could be significantly higher. Taking all of this into account, the total loss of permanent jobs in science at Kew will probably be at least 50, which is 25 percent of the current permanent science positions. However, if you include the 25 that took retirement, the loss of science positions would be 34 percent.

Equally disturbing is the division of the remaining herbarium staff into three areas: Americas, Africa, and Asia. Systematic groups such as the “Legumes” will no longer exist, and the leaders and staff of these groups will have to compete for jobs with everyone else. What is striking about this is that most of the world (including Kew scientists) has been moving to synthetic work with a global focus, and yet the administration at Kew is choosing to balkanize their research into areas. It is amazing that Muséum National d’Histoire Naturelle in Paris (P) has just worked hard to break down such barriers while Kew is building them. It makes it difficult for specialists in a particular family to view a plant group from a global perspective. Will we no longer have “world experts” at Kew?

In addition, the loss of support staff at Kew will be great, and that will mean that curators will have to spend more time doing technical work and less time on science. Those scientists who are able to obtain one of the herbarium positions may very well find themselves overwhelmed with



The U.S. National Herbarium will soon begin using a scanner, similar to the one pictured here, to capture images of herbarium specimens. The first project will scan 280,000 fern specimens and 20,000 Onagraceae specimens.

collections work as well as mentoring and teaching, and as a result have very little time to do research. Certainly Kew has a budget shortfall, but when you balance the budget by gutting research and collections staff, you fail to recognize that expertise in a group of plants is built up over many years and cannot be replicated once it is lost.

Biological specimens are critical for the next frontiers of climate change studies: they provide the evidence of past as well as present distributions. A deeper understanding of life on Earth in the past can help us predict and possibly mitigate the worst impacts of climate change in the future. Such information is not readily available, but it is becoming more so. For some collections it is now possible to view their data and images online, and this allows us to use advanced modeling techniques to predict which species may survive and which may go extinct.

Images alone are not enough. Names of organisms change frequently, and these proposed

changes need to be evaluated and either accepted or rejected. More importantly, a specimen is only useful if it has a proper identification. Many specimens are misidentified. Insuring that something is correctly identified requires a detailed examination of the actual specimen, usually under a microscope. As a result, all collections require constant curation to make them useful for climate change studies and other biodiversity studies. Collections that are not studied and maintained, even if they are physically well cared for, can become out-of-date and less useful.

The utility of collections does not stop with climate change. If you search for "Biological Collections" in Google Scholar, you will find a host of references on the use of such specimens ranging from phenological data to populations trends, utility of vouchers, DNA based phylogenies, biodiversity estimates, and trait evolution.

Lastly, the actions of these gardens and museums fail to take into account that to be relevant and

useful collections must continue to grow as new discoveries are made. Expeditions to poorly understood areas are critical for filling in holes in our data and for collecting new material in ways that allow the preservation of genome quality tissue for new methods of investigation. It seems that just when the world is beating a path to our door and asking for help and collaboration, we are closing our doors and turning them away.

Here at the Smithsonian Institution we are not immune. Since I was hired in 1981, our scientific staff has shrunk by about 50 percent and our collections staff even more. The Botany staff at the Smithsonian is concerned about our colleagues and the collections they study, at Kew and around the world. It is troubling that there seems to be an alarming trend in museum and garden administrations to devalue collections and the staff who study and care for them. This is a critical point in time to work toward a world-wide effort to stop and reverse this attrition.

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A Comparison between Solomon's Plume and Solomon's Seal

By Gordon Mitchell

Solomon's Plume *Maianthemum racemosum*

Wildflower enthusiasts who are familiar with the Solomon's Seal, *Polygonatum biflorum* [Walter] Elliott are probably familiar with its relative, the Solomon's Plume, *Maianthemum racemosum* [L.] Link. Although the leaves of both species are similar, their flowers are quite different.

Solomon's Plume is a member of the Order *Asparagales*, the Family *Asparagaceae*, and the Subfamily *Nolinoideae*. Some references place it in the Order *Liliales* and in the Family *Liliaceae*, the Family *Convallariaceae*, or the Family *Ruscaceae*.

The generic name, *Maiathemum*, is Greek for “May blossom.” *Maïos* or *maius* is “May” and *antheion* is “blossom” or “flower.” The specific epithet, *racemosum*, is Latin for “having a raceme,” due to its flowering cluster.

Previous scientific synonyms for this plant have been *Convallaria ciliata* (Desfontaines) Poirét, *C. racemosa* L., *Polygonastrum racemosum* (L.) Moench, *Sigillaria ciliata* (Desfontaines) Rafinesque, *S. multiflora* Rafinesque, *Smilacina ciliata* Desfontaines, *S. flexicaulis* Wenderoth, *S. latifolia* Nuttall ex Baker, *S. racemosa* (L.) Desfontaines, *Tovaria racemosa* (L.) Necker ex Baker, *Unifolium racemosum* (L.) Britton, *Vagnera australis* Small, *V. racemosa* (L.) Morung ex Kearney, and *V. retusa* Rafinesque.

This plant is called False Solomon’s Seal because it was thought to have no magical properties of the real Solomon’s Seal. At different times and places, other common names for this species are Clustered Solomon’s Seal, False Lily-of-the Valley, False Solomon’s Seal, False Spikenard, Feather False Solomon’s Seal, Feather Solomon’s Seal, Goldenseal, Jacob’s Ladder, Job’s Tears, Large False Solomon’s Seal, Plumed Solomon’s Seal, Scurvy Berry, Snake Corn, Solomon’s Feathers, Solomon’s Phone, Solomon’s Zigzag, Spiked Solomon’s Seal, Spikenard, Tobacco Berry, Treacle Berry, Wild Spikenard, Wood Lily, and Zigzag Solomon’s Seal.

DESCRIPTION

Perennial

Height: Its height is 1-3½ feet.

Stem: Its stem is single, unbranched, stiff, erect or arching, and slightly zigzag.

Leaves: Its leaves are simple and alternate. Each leaf is oblong, oval, elliptical, or lanceolate; bright green above and hairy below; ribbed; about 3-6 inches long and about 1-3 inches wide; and has a pointed tip and a blunt or rounded base. The leaves are sessile and may not clasp the stem. Its margin is entire and undulating. Its veins are broadly parallel and deeply etched. White-tailed deer eat the foliage.

Flowers: Its flowers are arranged in a branched, terminal, flat, feathery, pyramidal, and paniced 1-6 inch long cluster of 7-250 tiny flowers. Each flower is radially symmetrical; star-shaped; about 1/8-¼ inches long; about 1/6 of an inch wide; creamy white; and fragrant. It has 3 petals, 3 sepals, 6 stamens that are longer than the tepals, and 1 pistil. All flowering parts are attached at the base of the ovary. Bees, flies, and beetles pollinate these flowers. Their blooming period is 3 weeks.

Flowering season is April to July.



Solomon’s Plume, *Maianthemum racemosum*
Picture taken from uswildflowers.com



Solomon’s Plume, *Maianthemum racemosum*
Picture taken from uswildflowers.com

Fruit: Its fruit is a rounded berry with 1-2 seeds. When young, the berry is yellow-green or whitish with red or brown spots. It later becomes a dull, translucent red with purple spots. Each berry has 3 chambers with 1-2 seeds per chamber. The seeds are roundish and slightly wrinkled. Some of the seeds are produced without fertilization and are genetically identical to the parent plant. Birds and small mammals eat these berries and help spread the seeds.

Roots: Its root system consists of stout, thick, cylindrical, creeping, fleshy, light brown, knotty, and elongated rhizomes with secondary fibrous roots.

Habitat: Its habitats consist of moist, rich deciduous or mixed woods; thickets; floodplains; stream banks; savannas; clearings; and roadsides. They may be found in large patches.

Range: Its range covers Canada and the U.S. as far west as the Rocky Mountains.

Uses:

Solomon's Plume has several medicinal uses. It was used as an anti-hemorrhagic, an analgesic, an anthelmintic, a diaphoretic, a diuretic, a purgative, a sedative, a stimulant, and a tonic. A root tea was used for treating constipation, rheumatism, and stomach trouble. A leaf tea was used as a contraceptive and for treating coughs. The root smoke was inhaled for treating insanity and to induce sleep. A root poultice was used for treating sunburns. A leaf poultice was used for bleeding, itching, and rashes. This plant was also used for treating aches and pains, cuts, colds, headaches, heart trouble, itching, kidney ailments, snakebites, sore throat, and swelling.

Solomon's Plume has some edible uses as well. The rootstock is edible but bitter. It should be boiled in several changes of water or soaked overnight in wood ash lye mixture of ½-¾ cups of ash to 1 gallon of water. Afterwards, it is parboiled for ½ hour to remove the lye. It can be pickled and used as relish or eaten like a potato. The young shoots can be boiled in salt water for 10 minutes and eaten like asparagus. The berries are also edible. They taste like treacle, a bitter English molasses, and contain vitamin C. They were once used for treating scurvy. However, they are cathartic if consumed in large amounts.

Solomon's Seal *Polygonatum biflorum*

Most plant species have their flowers located above the leaves or in places where they can be easily pollinated by the wind or by the insects. One plant species has its flowers located in an inconspicuous site below the leaves. That species is the Solomon's Seal, *Polygonatum biflorum* [Walter] Elliott.

Solomon's Seal is a member of the Order *Asparagales*, the Family *Asparagaceae*, and the Subfamily *Nolinoideae*. Many references place it in the Order *Liliales*, the Family *Liliaceae*, the Family *Ruscaceae*, or the Family *Convallariaceae*.



Solomon's Seal, *Polygonatum biflorum*
Picture taken from uswildflowers.com

The generic name, *Polygonatum*, is Greek for “many joints or knees,” referring to its knobby rootstock. *Poly* is “many” and *gonatum*, *gonun*, *gonu*, or *gony* is “joints” or “knees.” The specific epithet, *biflorum*, is Latin for “two flowers.”

Previous scientific synonyms for this plant were *Convallaria angustifolia* (Pursh) Poir., *C. biflora* Walter, *C. commutata* J.A. Schultes & J.H. Schultes, *Polygonatum angustifolium* Pursh, *P. canaliculatum* (Willdenow) Pursh, *P. cobrense* (Wooton & Standley) R.R. Gates, *P. commutatum* (J.A. Schultes & J.H. Schultes) A. Dietrich, *P. ellipticum* Farwell, *P. giganteum* A. Dietrich, *P. herbetifolium* (R.R. Gates) Bush, *P. latifolium* Pursh nomen illegitimum, *P. melleum* Farwell, *P. ovatum* (Farwell) Bush, *P. parviflorum* A. Dietrich, *P. virginicum* Greene, *Salomonina biflora* (Walter) Britton, *S. cobrensis* Wooton & Standley, *S. commutata* (J.A. Schultes & J.H. Schultes) Britton, *S. commutatum* (J.H. Schultes), *Sigillaria angustifolium* (Pursh) Rafinesque, *S. canaliculata* (Willdenow) Rafinesque, and *S. elliptica* Rafinesque. Many of these names were of other species that have now been re-classified as subspecies.

The common name, Solomon's Seal, possibly referred to the flat, circular scars upon the rootstock. These scars may resemble stamped wax envelope seals or the seal of King Solomon, the 10th century B.C. King of Israel. It may have also been so named because the roots were used to treat or “seal” wounds or broken bones. Because of that, Solomon was thought to be a magician. Another possibility that it was so named because the flower, if dipped in ink and pressed against paper, would leave a mark resembling the 6-pointed Star of David.

At different times and places, other common names for this species are American Solomon's Seal, Conquer John, Drop Berry, Giant Solomon's Seal, Great Solomon's Seal, John-the-Conqueror Root, King Solomon's Seal, Lady's Seal, Lesser Solomon's Seal, Lily-of-the-Valley Vine, St. Mary's Seal, Sealroot, Sealwort, Smooth Solomon's Seal, and Wild Lily-of-the-Valley.

DESCRIPTION

Perennial

Height: Its height is 8-72 inches. Larger plants may have double the number of chromosomes as the smaller plants.

Stem: Its stem is single, stout, erect or arching, slightly zigzag, smooth, and unbranched. It is leafy upon the top. The stem is also shiny, waxy, and has a rounded cross-section. All plants within a single group may arch in the same direction.

Leaves: Its leaves are simple and alternate. These leaves cover the entire length of the stem and are spaced closely together. Each leaf is broadly lanceolate, elliptic, or ovate; about 1½-7 inches long and about 2-3½ inches wide; smooth; light green, and hairless above and pale downy below; and sessile or short-petioled. Its margin is smooth and wavy. These leaves clasp the stem. Its veins are linear and parallel with 1 or more strong veins upon each side of the midrib. White-tailed deer may eat the foliage. The leaves turn a bright golden yellow in the fall. These leaves fall before the fruits ripen.



Solomon's Seal, *Polygonatum biflorum*
Picture taken from fnanaturesearch.org

Flowers: Its flowers are white to greenish-yellow, tubular, bell-shaped, and about ½-1 inches long. They are dangling or drooping below the stem at the leaf axils and are arranged singly or in non-terminal umbelled clusters of up to 10. Each flower is radially symmetrical; has 6 tepals that are joined to form a tube with 6 short, spreading, recurved lobes; 6 stamens; and 1 pistil with 1 style. The style is shorter than the anthers, which prevents self-pollination. All flowering parts are attached at the base of the ovary. These flowers are pollinated by bumblebees and by ruby-throated hummingbirds. Their blooming period lasts about 3 weeks. Flowering season is April to July.

Fruits: Its fruits are rounded berries. They are about ¼-½ inches in diameter, and are initially green but later become dark blue-purple to black. Each berry is 3-chambered with 1-2 seeds per chamber. The seeds are roundish and pale brown. Birds and mammals eat these fruits and spread the seeds.

Roots: Its root system consists of thick, stout, fleshy, creeping, deep, horizontal, whitish, jointed or knotty rhizomes. They have their scars upon the upper surface. A new scar is added every year. They also have fibrous rootlets. Some mammal species eat these rootstocks.

Habitat: Its habitats consist of dry to moist woods, thickets, fields, prairies, swamps, roadsides, and old homesteads. They prefer acidic soils. Although Solomon's Seals are found in clumps, they are not found in large colonies.

Range: Its range is most of the eastern U.S. and Canada as far west as the Rocky Mountains.

Uses:

Solomon's Seal has edible uses. The rootstalks are starchy like potatoes. The rootstocks can be dried, ground into flour, and used in making bread. These rootstocks are starchy and can be boiled and eaten like potatoes or added to soups. Because the rootstocks contain tannin and calcium oxalate crystals, they should be boiled for at

least 20 minutes before eating. The young shoots, before the bitter-tasting leaves unfurl, are also edible. They can be eaten raw or boiled for 10-15 minutes like asparagus. Both the rootstocks and the young shoots should be peeled before cooking. Even the flowers are edible. They can be eaten steamed or raw.

Solomon's Seal has medicinal uses. Its roots are used as a decoction, an infusion, a poultice, a tea, and a wash. It was used as an anti-inflammatory, an astringent, a demulcent, a diaphoretic, a diuretic, an expectorant, a sedative, and a tonic. It was used for treating arthritis, bruises, coughs, cuts, dysentery, female disorders, gout, headaches, heart problems, hemorrhoids, indigestion, kidney ailments, lung ailments, poison ivy rashes, rheumatism, skin irritations, and sores. These roots contain asparagin, convallarin, mucilage, saponins, and tannin.

The berry fruits are mildly toxic and should not be consumed. They contain the glycoside anthraquinone, which is a purgative. They can also cause cardiac disorders, hemolysis, and hypoglycemia.

The rootstocks had other uses as well. In parts of the Deep South, the slaves used the rootstocks in voodoo rituals. The rootstocks can be burned within a house for a pleasant incense-like fragrance.

Gordon Mitchell works for the Columbus, Ohio Metroparks and was a member of the Central Ohio Native Plant Society, which merged with the Columbus Historical Society in the Spring of 2010.

The first part of the article on Solomon's Plume appeared in *Inpaws* (www.inpaws.org/wp-content/uploads/GM_Solomon_Plume.doc), with slight modifications. The second part also appeared in *Inpaws*: www.inpaws.org/wp-content/uploads/GM_SolomansSeal.doc.

Folklore:

Thistle Tales

By Tim Snyder

Never grab a thistle by the stem. This is a lesson I have to learn every summer. Thistles have a pernicious determination to survive in my garden, and they have no respect for gloves.

If there is such a thing as a violent weed, thistles are it. Well-armed with spikes on leaf, stalk and even flower, they repel all advances. In the Victorian language of flowers, they stand for surliness—not exactly the message you'd want to send to your sweetest. Cows wisely refuse to eat them, and so they will be found standing alone like silent sentinels in otherwise low-shorn pastures, earning the common name—bull thistles.

And yet even thistles have their positive side. Anything that attracts flocks of darting goldfinches, those connoisseurs of thistle seed, cannot be all bad.

The Scots think highly of thistle, having made it their national flower, in part, perhaps, because of its rugged, independent character. Traditionally, the Scottish reverence for thistles goes back to the depths of the Middle Ages when a Danish raiding party, trying to creep into a sleeping village of Scots, took off their boots to silence their advance only to encounter a phalanx of thistles: the resulting commotion roused the Scots to a successful defense.

Thistles belong to the composite family, as a close look at their flowers will show. What appears to be a single feathery bloom is actually a tightly clustered congregation of tiny flowers held together by a cup made of tiny, overlapping, leaf-like and spine-tipped phyllaries. Flower heads commonly range in color from pink through rose to purple, but



Swamp Thistle. Picture taken from www.prairiemoon.com.

white versions are occasionally found.

While we may consider them a nuisance, bees are quite enamored of thistles. Their flowers are sweet-scented and contain an abundance of both pollen and nectar.

The most common thistles encountered in Ohio are imports. Bull thistles can be 3-6 feet tall. Canada thistle, which is not actually from Canada but Eurasia thrives in roadsides, abandoned fields and other disturbed ground. Its small flower heads color whole swaths of ground a dull pink while the massed ranks of their spiny stems give full expression to the scientific names of one of its varieties—*horridum*.

Ohio's native varieties aren't much friendlier. There are at least five thistles considered to be original to the state, all of them share the prickly disposition of their imported cousins, along with the typical tufted purple to pink flower heads. The rarest of these are the Carolina thistle, a southern species that can be found in the southeast area of the state, and Hill's thistle, which prefers sandy open fields in Ohio's east-central counties.

The most elegant of our native thistles—at least to my eye—is the swamp thistle, found in calcareous wetlands in Ohio. It is limited almost entirely to fens—those spring-fed, cold-water refuges that hold so many of our interesting northern species. Their purple flowers have the richest color of any of our thistles. Not content with that show, the points of the phyllaries surrounding the base of the flower head, like the shingles of an upside-down roof, are also flushed with purple, as are segments of the relatively unarmed stem. Also of interest is the stickiness of the flower head base, which prompted its species name, *muticum*. It is an altogether strikingly handsome, friendly plant—for a thistle.

Tim Snyder is a retired west-central District Preserve Manager of DNAP (Ohio Division of Natural Areas and Preserves). He is currently on the board of ONAPA (Ohio Natural Areas and Preserves Association).

Collier (Howard) State Nature Preserve



A large wooden stairway leads from the ridgetop parking lot down to the heavily wooded floodplain

Collier State Nature Preserve is located on the Sandusky State Scenic River. The Division of Natural Areas and Preserves originally acquired the site as a Scenic River Area. This state nature preserve is located in north-central Ohio, 8 miles south of Tiffin, Ohio, along the banks of the Sandusky River. It is an old-growth floodplain community of about 80 acres within a 200-acre preserve. The preserve contains a large old wooded riverine corridor, which is roughly half of the total acreage, a ridge top forest, bluffs and floodplains. A riparian corridor helps protect the Sandusky River.

The older forest on the bluff is a mixture of mature beeches and large red oaks on the upper slopes, grading into a mixture of young tuliptrees and walnuts on the lower slopes. The floodplain closest to the bluffs is quite open, wet and brushy with a few large snags here and there. By far the largest tuliptree in the preserve is located quite incongruously all by itself in this very wet area. As one proceeds toward the river the mature forest closes

in. The wettest areas are dominated by the typical water loving species of north-western Ohio: silver maple, cottonwoods, sycamores, with a few elms mixed in.

As one gets closer to the river, the land rises slightly and the forest composition changes again. While oaks, mostly red and white, and tuliptrees dominate the canopy, butternut and shagbark hickories and a few green ashes put in a respectable appearance. At the far eastern end of the reserve a few old, open-grown oaks mark an old home site or pasture, a big burr oak being the largest.

In the spring, the preserve boasts some of the best wildflowers in Ohio. That includes spring beauty, sharp-lobed hepatica, Dutchman's breeches, squirrel-corn, twinleaf, white and yellow trout-lily and three species of trilliums, including Ohio's state flower: the large-flowered trillium. Temporary vernal pools are used by salamanders, frogs and other amphibians for breeding.

The one-mile Beech Ridge Trail runs from the preserve's parking lot on Township Road 38 to the floodplain. You can also access the floodplain via Little Fox Run Trail.

Visitors are reminded to stay on the trails. The preserve is closed to vehicles in the winter, but foot traffic is welcome. There are no restrooms or drinking water.

The Preserve is located approximately 3 miles northeast of McCutchenville, at the southwestern edge of Seneca County. From McCutchenville, proceed 3 miles east on County Rd 58, then 0.5 miles north on Township Rd 131, and 0.25 miles east on Township Rd 38. The facilities include a large parking area and 1.5 miles of trails.

The preserve is named after Howard L. Collier of Toledo (1932-1990), a former Ohio budget director.

Content for this article taken from the websites of ODNR (<http://naturepreserves.ohiodnr.gov/collierhoward>) and the Native Tree Society, BBS (www.ents-bbs.org).

Interesting Factoid:

Bison Play a Key Role in Grassland Ecosystem Health

The northern Great Plains ecosystem of North America was once inhabited by free ranging herds of bison numbering in the millions. In the 1800s, human settlement in the area led to large scale slaughter of bison and conversion of much of the grass prairie to agriculture. Only relatively recently, with the reintroduction of bison herds, have restoration and conservation efforts led to protect tracts of mixed-grass prairies.

A mixed grass prairie is land that receives too little rain for trees to grow in great numbers. Instead, these lands are covered in grasses and grass-like plants that have growing points close to the soil and can keep on growing even after being nibbled on by animals. Grasslands typically exist between deserts and forests where they act as a transitional biome. While typical native grassland vegetation is very diverse and includes many grass species mixed with a wide variety of forbs, species richness and composition varies with topography and geographic location. Grass species include both tufted and rhizomatous species such as big bluestem, *Andropogon gerardii*, Indiangrass, *Sorghastrum nutans*, and wildrye. *Elymus* spp., among others. Forbs include tickseed, *Coreopsis* sp., wild bergamot, *Monarda fistulosa*, prairie blue-eyed grass, *Sisyrinchium campestre*, and goldenrod, *Solidago* spp., among others.

The Nature Conservancy claims that grasslands and prairies are "the world's most imperiled ecosystem." This is based on the group's calculation that only 5 percent of grasslands are protected globally and remain "greatly threatened" by invasive species, suppression of natural fire, and urbanization.

Interesting Factoids:

- Bison are voracious grazers, and their grazing increases native plant and wildlife diversity. Bison's grazing tends to be patchy, and they revisit areas throughout the season. Therefore they create a mosaic of grazed and ungrazed areas. Because bison selectively graze on dominant grasses while avoiding most forbs and woody species, the resulting patchy distribution of vegetation favors increased plant species diversity by allowing forbs to flourish.
- Bison wallows create unique habitats. Wallows are a unique ecological feature of prairie ecosystems created by bison. By rolling repeatedly in exposed soil, bison increase soil compaction in certain areas which aids in water retention. In the spring, these wallows produce temporary pools that can support ephemeral wetland species. In the summer, the wallows support a different vegetation structure and composition that is more

drought and fire resistant. The combined effect of bison wallows is an increase in spatial environmental heterogeneity and local and regional biodiversity.

- These grasslands did not develop in a vacuum. In fact, North America's grasslands evolved over tens of thousands of years of continuous grazing by large ruminants, most notably the American bison. This co-evolutionary process of grasses and grazers developed into a symbiotic relationship that is vital to the health of both.
- Grasses across most of the semi-arid regions of North America produce roughly one-third more growth each year than will naturally decompose. Without interaction from grazers or fire, this excess growth soon chokes the soil and prevents healthy plant growth. Bison moving across pastures not only remove that choking cover, the animals convert the cellulose in the plant into protein.
- As the bison graze, their manure and urine supply important nutrients for the plant cover, and their hoofs stir the soil, helping to bury seeds and to create small pockets in the earth to capture precious moisture. Many current prairie potholes (small ponds) began as buffalo wallows.
- Sadly much of the grasslands in the US are under siege from livestock! Cattle that are left to graze on the grasslands are not native to this fragile ecosystem, and after years of grazing, they have caused some serious damage. The grass is not given enough time to regrow because of the vast number of cattle that graze. When the new grass does grow, it is quickly consumed. This has not only changed the face of the grasslands, but it has changed the soil.
- In recent years, land managers of other livestock species have adapted practices—such as rotational grazing—to try to imitate the natural interaction of bison with the soil. Those practices are beneficial, but will never completely replicate the natural patterns of bison.



A small herd of bison can be seen a half hour west of Columbus, Ohio at Battelle Darby Creek Metro Park: Metroparks.net/parks-and-trails/battelle-darby-creek

Some popular prairie restoration projects have been completed and maintained by conservation departments, such as Midewin National Tallgrass Prairie, located in Wilmington, Illinois. This restoration project is administered by the U.S. Department of Agriculture Forest Service and the Illinois Department of Natural Resources. It sits on part of the Joliet Army Ammunition Plant, specifically on an area once contaminated from TNT manufacturing. Since 1997, the project has opened some 15,000 acres of restored prairie to the public.

Another large restoration project finds its home on the ample area of Fermilab, a U.S. governmental atomic accelerator laboratory located in Batavia, Illinois. Fermilab's 6,800 acres sits atop fertile farmland, and the prairie restoration project consists of approximately 1,000 acres of that. This project began in 1971 and continues today with the help of Fermilab employees and many community teachers, botanists and volunteers and Bison. These days, in Fermilab grasslands we commonly see plants such as big bluestem, Indian-grass, prairie dropseed, compass plant, prairie dock, shooting star, gayfeather, false indigo, wild quinine, golden alexander, yellow and purple coneflowers, rosinweed, wild bergamot, lead plant, rattlesnake master, and butterfly weed.

The Nature Conservancy purchased Nachusa Grasslands. It consists of 3100 acres of prairie remnants, restorations, and reconstructions located between Oregon, Dixon, and Franklin Grove, Illinois. Remnant prairie knobs were protected from the plow by an unfarmable overlay of St. Peter Sandstone. Starting in 1986 with the purchase of 250 acres, The Nature Conservancy has gradually recreated a vision of 1800 Illinois' mosaic of prairie, savanna, and wetlands.

This article was written by Diane Christensen and is based on material taken from wikipedia.org, nachusagrasslands.org, National Bison Association at bisoncentral.com, and wildlifeadaptationstrategy.gov. Picture taken from ohio-nature.com.



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